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Abstract of the Disclosure

In a plasma CVD apparatus, a plate formed with a plurality of perforated holes is arranged to separate a plasma generation region and a processing region. The aperture ratio of the perforated holes to the plate is not greater than five percent. Plasma including radicals and excited species is generated from an oxygen (O_2) gas in the plasma generation region, then the radicals and excited species flow into the processing region through the perforated holes. A monosilane (SiH_4) gas is also supplied into the processing region, but the backward flow of the monosilane gas into the plasma generation region is suppressed by the plate. In the processing region, the radicals and the excited species and the monosilane gas result in a gas phase reaction that yields the silicon dioxide film formed on the substrate or the wafer with high quality.

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